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(71) Applicant(s)
Dyecor Limited
(Incorporated in the United Kingdom)
Nero House, Unit E, Hazleton Interchange,
Lakesmere Road, HORNDEN, Hampshire, PO8 9JU,
United Kingdom

(72) Inventor(s)
Roderick Iain Davidson

(74) Agent and/or Address for Service
Nigel Brooks
Hill Hampton, East Meon, PETERSFIELD, Hampshire,
GU32 1QN, United Kingdom

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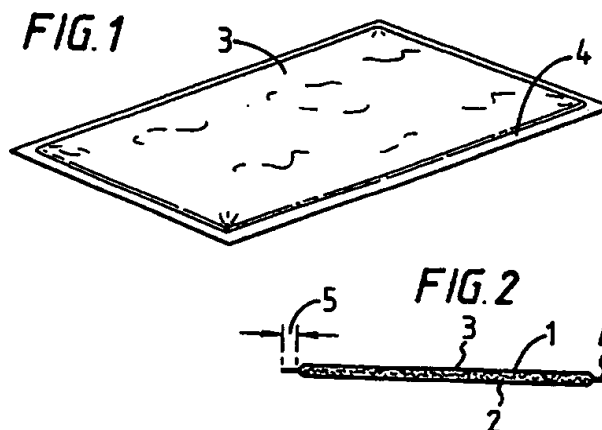
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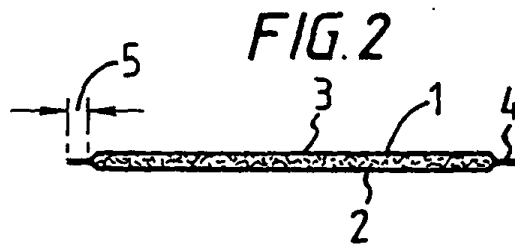
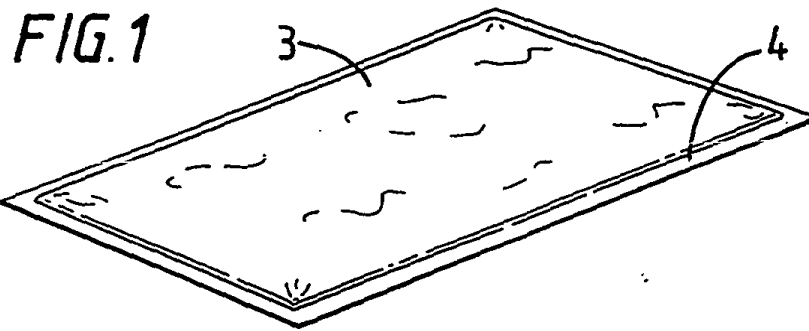
(54) Abstract Title
Absorbent pad

(57) An absorbent pad has a core 1 of an air laid web incorporating superabsorbent material in fibrous form and bonding synthetic fibre. The web is laid on a backing 2 and is covered with a plastics material release layer 3. The edges 4 of the pad are compressed along a margin 5, with the web being flattened and heat bonded in its compressed state, with the backing and release layers united to it. The release layer is not otherwise bonded to the air laid web. This compression of the air laid web captivates fibres of the web from escaping from the cut edges.



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ABSORBENT PAD

The present invention relates to an absorbent pad, particularly though not exclusively for use in food trays.

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It is established practice to display meat for sale in covered trays having a pad for absorbing blood from the meat. Normally such pads are formed of an absorbent material with a top release layer, which prevents direct contact between the meat and the absorbent material and allows easy separation of the meat from the pad.

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So called "super-absorbent" materials are known, which absorb many times their dry weight of water. They are based on sodium acrylate copolymer. They are available from Technical Absorbents Ltd. of Grimsby in England.

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It is known to form webs by the "air laid" process on equipment from Dan-Webforming A/S of Risskov in Denmark. Such webs usually incorporate synthetic fibres, which soften under heat in the process and bond together with other fibres in the web.

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In our International Application No. PCT/GB98/0049 ("Our International Application") there is described and claimed:

An absorbent pad material comprising:

a backing;

25 an air laid web on the backing, the web incorporating super-absorbent material in fibrous form and bonding synthetic fibre; and

a plastics material release layer on the side of the web opposite from the backing,

wherein the plastics material of the release layer is based on a polymer having a melting point which is higher than at least a surface layer of the bonding synthetic fibre, whereby in use the air laid web can be heat bonded together in a compressed structure peripherally of a pad by application of heated members to the backing and/or the release layer; AND

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An absorbent pad cut from a sheet of the absorbent pad material, wherein the three layers of the pad, i.e. the backing, the air laid web and the release layer are compressed to a state thinner than that of the rest of the pad, with the material of the air laid web being bonded together in a compressed structure, at least at the cut edges of the pad, whereby fibres of the web are captivated at the cut edges; AND

A method of manufacturing absorbent pads of the second aspect, the method consisting in the steps of:

heating bondingly compressing a sheet of the absorbent pad material by application of heated members to the backing and/or the release layer in strips to define absorbent pads wherein fibres of the web are captivated, and cutting the sheet to form the pads; AND

A machine for manufacturing absorbent pads of the invention from a sheet of absorbent pad material of the invention, the machine comprising:

means for successively feeding the said sheet,
means for compressing the sheet at strips to define the pads by heat bonding the material of the air laid web, and
means for cutting the sheet at the strips.

The object of the present invention is to provide an improved absorbent pad and method of its manufacture.

In the improved pad, the release layer is not laminated to the air laid web, but heated bonded thereto at the compressed edges of the pad only. This avoids the necessity for the relatively expensive lamination.

Thus according to a first aspect of the present invention there is provided an absorbent pad comprising:

a backing;
an air laid web on the backing, the web incorporating super-absorbent material in fibrous form and bonding synthetic fibre, the web being united together and secured to the backing by the bonding synthetic fibre; and
a plastics material release layer on the side of the web opposite from the backing, the plastics material of the release layer being based on a polymer having a

melting point which is higher than at least a surface layer of the bonding synthetic fibre;

the pad having a peripheral region including cut edges of the pad and being compressed in the peripheral region at least, whereat the three layers of the pad, i.e. the backing, the air laid web and the release layer are compressed to a state thinner than that of the rest of the pad, with the material of the air laid web being bonded to the release layer and together in a compressed structure, whereby fibres of the web are captivated at the cut edges, the release layer not being bonded to the air laid web in the rest of the pad.

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According to a second aspect of the invention there is provided a method of manufacturing absorbent pads of the first aspect, the method consisting in the steps of:

bringing together the air laid web on its backing and the release layer;

heat-bondingly compressing the air laid web and the release layer by

application of heated members to the backing and/or the release layer in strips to define the absorbent pads whereby the material of the air laid web is bonded to the release layer and together in a compressed structure; and

cutting the sheet at the peripheral regions of pads to form them.

The materials of the pad are preferably the same as in Our International Application, which is incorporated herein by reference. Thus the synthetic fibre of the web is preferably a bicomponent of a polypropylene fibre with a polyethylene coating. The plastics material release layer is preferably a polypropylene based material, which has a higher melting point than polyethylene. Normally, the backing will be a synthetic non-woven tissue. Preferably, the air laid web includes wood pulp fibre to improve the texture and cost of the web.

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The backing, the air laid web and the release layer can be additionally compressed together in other areas of the pad, to show a logo for instance.

Preferably, the ratio of thickness of the rest of the pad to the compressed edges is between 9:1 and 2:1 and normally between 7:1 and 3:1.

The strips can be compressed by means of heated rollers rolled over the laminated web. Alternatively, the strips are compressed by means of heated dyes impressed into the laminated web.

5 To help understanding of the invention, specific embodiments thereof will now be described by way of example and with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of a pad of the invention;

Figure 2 is an end view of the pad;

10 Figure 3 is a diagrammatic side view of a machine for making the pad;

Figure 4 is a front view of one of the heat sealing platens of the machine of Figure 3.

The pad shown in Figures 1 & 2 has a core 1 of an air laid web consisting of:

- 15 52% of wood pulp fibre,
30% of super-absorbent fibre,
18% of thermoplastic bonding material.

The super-absorbent fibre is 6mm long fibre sold under the OASIS trade mark by Technical Absorbents Ltd. The bonding material is polyethylene coated
20 polypropylene fibre sold by Danaklon A/S of Varde in Denmark.

The web is laid on a non-woven polyethylene tissue 2 and is covered with a release layer film 3 of polypropylene based material, suitably SWF film as sold under the TRESPAPHAN trade mark by Hoechst Trespaphan UK Ltd of Swindon. The
25 material is corona discharge treated whereby it can be printed, on the side which is laminated to the air laid web, prior to the lamination. The printing is then visible through the film 3.

The edges 4 of the pad are compressed, typically along a 3mm wide margin 5,
30 with the web being flattened and heat bonded in its compressed state, with the backing and release layers united to it. The release layer is not otherwise bonded to the air laid web. This compression of the air laid web captivates fibres of the web from escaping from the cut edges.

In use, the pad is secured in a meat tray, with the release layer uppermost. This avoids the meat sticking to the pad. Blood from the meat can flow around the edges of the pad and pass through the non-woven tissue to be absorbed into the web.

5 Figure 3 shows diagrammatically one form of machine for manufacturing pads. This process is generally carried out at a site separate from the air laying. The machine has reciprocating compression and cutting stations 50,51. The air laid web on its backing is fed from a roll 40, whilst the release material from a roll 40' is fed over a jockey roller 52', both passing to a pneumatic feeding device 53, which
10 comprises a clamp 54 and its actuator 55, which are connected to an advance bar 56 via short stroke actuators 57, a pair of which are provided at opposite end of the bar 56 corresponding to opposite sides of the material. The bar is movable vertically between stops 58,59 by a long stroke actuator 60. The clamp holds the web and the release layer vertically and the feeding device is thus arranged to feed them vertically
15 downwards. Beneath the feeding device, an opposed pair of heated platens 61,62 are provided. These have lands 63 which define regions of compression of the web and the release layer, the regions being a plurality of vertically arranged strips 64, with top and bottom horizontal strips 65, which together define the edges of a plurality of pads side by side. Typically the pads are 9.5 x 15.0mm, with the strips 64,65 being 0.5mm
20 wide. One platen 61 is fixed and the other is reciprocatably mounted for movement towards and away from the other by a hydraulic actuator 66.

Beneath the platens a cutter is provided in the form of a fixed array of anvil strips 67 laid out in the pattern of the lands 63 and a reciprocatable array of knives 68,
25 also in the same pattern. A further hydraulic actuator 69 is provided for moving the knives. Within each pad area defined by the knives, a pneumatically operated pusher 70 is provided for pushing cut pads into reception trays 71. Beneath this cutter, a waste feeder 72 is provided with jaws 73 for gripping wasted left at the edges of the pad material.

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In operation, the actuators 66,69 are cycled together. The web and the release layer is then fed by the feeders 53, 72 and the actuators recycled and so on. After application of the platen 62 towards the fixed platen 61, for uniting the web and release layer and their compression at pad peripheral regions, they have a tendency to

adhere to the platens when the actuator 66 is cycled. To pull them off, the short stroke actuators 57 draw up the clamp 54 before the long stroke actuators 60 feed the web and the release layer down between the platens. The previously compressed strips 64,65 are moved down to register with the knives 68, which are advanced to cut
5 as the platens impress fresh strips above. Immediately on operation of the knives, the pushers 70 feed the cut pads into the trays 71, where lines 74 of pads accumulate for packing and distribution. The waste material is pulled down from the cutters by the feeder 72 in synchronisation with the long stroke actuator 60. All the feed devices return to their initial position during the operation of the actuators 66,69.

CLAIMS:

1. An absorbent pad comprising:
 - a backing and an air laid web on the backing, the web incorporating super-absorbent material in fibrous form and bonding synthetic fibre, the web being united
 - 5 together and secured to the backing by the bonding synthetic fibre; and
 - a plastics material release layer on, but only partially bonded to, the side of the web opposite from the backing, the plastics material of the release layer being based on a polymer having a melting point which is higher than at least a surface layer of the bonding synthetic fibre,
 - 10 the three layers of the pad, i.e. the backing, the air laid web and the release layer being compressed to a state thinner than that of the rest of the pad, with the material of the air laid web being bonded together in a compressed structure and the release layer bonded thereto, at least at the cut edges of the pad, whereby fibres of the web are captivated at the cut edges, the release layer not being bonded to the air laid
 - 15 web in regions of the pad which are not compressed.
2. An absorbent pad as claimed in claim 1, wherein the synthetic fibre of the web is a bicomponent polymer of a polypropylene fibre with a polyethylene coating.
3. An absorbent pad as claimed in claim 1 or claim 2, wherein the release layer is a polypropylene based material.
- 20 4. An absorbent pad as claimed in claim 1, claim 2 or claim 3, wherein the backing is a synthetic non-woven tissue.
5. An absorbent pad as claimed in any preceding claim, wherein the air laid web includes wood pulp fibre.
6. An absorbent pad as claimed in any preceding claim, wherein the backing, the
- 25 air laid web and the release layer are additionally compressed together in areas of the pad other than at the cut edges.
7. An absorbent pad as claimed in any preceding claim, wherein the ratio of thickness of the rest of the pad to the compressed edges is between 9:1 and 2:1 and normally between 7:1 and 3:1.
- 30 8. A method of manufacturing absorbent pads, the method consisting in the steps of:
 - bringing together an air laid web on its backing with a release layer;
 - heat-bondingly compressing the air laid web and the release layer by
 - application of heated members to the backing and/or the release layer in strips to unite

the web and the release layer and to define the absorbent pads whereby the material of the air laid web is bonded together in a compressed structure and to the release layer at the strips; and

cutting the sheet at at least some of the strips to form the pads.

5 9. A method as claimed in claim 8, wherein the strips are compressed by means of heated rollers rolled over the release layer, web and backing.

10. A method as claimed in claim 8, wherein the strips are compressed by means of heated dyes impressed into the release layer, web and backing.

11. A machine for manufacturing absorbent pads from a release layer and an air
10 laid web & backing, the machine comprising:

means for bringing together the release layer and the air laid web & backing,

means for successively feeding the release layer, web and backing,

means including heated members to the backing and/or the release layer for
15 heat-bondingly compressing the release layer, web and backing at strips to unite the web and the release layer and to define the absorbent pads whereby the material of the air laid web is bonded together in a compressed structure and to the release layer at the strips; and

means for cutting the sheet at at least some of the strips to form the pads.

12. An absorbent pad substantially as hereinbefore described with reference to
20 Figures 1 and 2 of the accompanying drawings.

13. A method of manufacturing absorbent pads substantially as hereinbefore described with reference to Figures 3 and 4 of the accompanying drawings.

14. A machine for manufacturing absorbent pads substantially as hereinbefore described with reference to Figures 3 and 4 of the accompanying drawings.